

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: McCarthy, *et al.*
Appl. No.: 10/559,986
Conf. No.: 6606
Filed: September 11, 2006
Title: POLYNUCLEOTIDE SEQUENCE ENCODING CYSTEINE PROTEASE FOR
MODULATION OF COFFEE FLAVOUR PRECURSOR LEVELS IN GREEN
COFFEE GRAINS (*as amended*)
Art Unit: 1652
Examiner: Sheridan Swope
Docket No.: 112701-667

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. §1.132 OF JAMES MCCARTHY
TRAVERSING GROUNDS OF REJECTION**

Under 37 C.F.R. 1.132 and regarding the rejection of claims 1-4 and 17-21, I, James McCarthy, do hereby declare that:

1. I am one of the named inventors of the above-identified patent application and therefore familiar with the inventions disclosed therein.

2. I have reviewed the 10/559,986 patent application entitled "POLYNUCLEOTIDE SEQUENCE ENCODING CYSTEINE PROTEASE FOR MODULATION OF COFFEE FLAVOUR PRECURSOR LEVELS IN GREEN COFFEE GRAINS," and understand that claims 1-4 and 17-21 are pending.

3. I have read the Office Action that was mailed by the U.S. Patent and Trademark Office on July 6, 2009 regarding the 10/559,986 patent application, particularly pages 2-4 of the Office Action (*i.e.*, the claims rejections under 35 U.S.C. §101/112).

4. It is my understanding that the Patent Examiner has asserted that claims 1-4 and 17-21 lack utility.

5. I have conducted an analysis of the coffee CcCP1 cysteine proteinase using SignalP-NN prediction software <http://www.cbs.dtu.dk/services/SignalP/>. This analysis indicates that CcCP1 has a signal peptide of approximately 25-30 bases. Further, an alignment of CcCP1 with CPR4 indicates that CcCP1 is expected to have an approximately 65 amino acid propeptide region. The signal peptide and propeptide regions are not part of the mature protein. When these regions are removed from the CcCP1 and CPR4 sequences, the sequence similarity between the two proteins rises to ~70% over a stretch of approximately 240 amino acids residues (see, Exhibit A).

6. CPR4 is a art accepted plant cysteine protease (see, Fischer *et al.* (2000) *Plant Molecular Biology* 43:83-101, attached as Exhibit B).

7. Persons skilled in the art of molecular biology consider two proteins homologous when they exhibit greater than 35% sequence identity over a stretch of at least 100 amino acid residues.

8. The very high sequence similarity (~70%) found between CcCP1 and the CPR4 protein strongly suggests that these proteins are orthologous proteins.

9. Additionally, my laboratory has demonstrated that the RNA that codes for the CcCP1 protein is precisely expressed at the expected time during seed development in coffee to be a CPR4 homologue. The fact that the expression patterns of the corresponding genes (expressed in the same tissues at related periods of development (see Muntz *et al.* (2001) *J. Exper. Botany* 52:1741-1752) supports our contention that CcCP1 is a cysteine proteinase.

10. It is my belief that both sequence and expression analysis evidence that CcCP1 is a cysteine protease.

11. I further declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true,

and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and the such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date:

September 25 2009


James McCarthy

Exhibit A

Short CcCP1	YSTHEEYVHRLGI FAKNLAKAAEHQAMDPISAI HGVTFQFSDLTEEEFEATY MGLKGGAGVGGITQLGKDDGDGDESAAE 76
Short CPR4	YSTTEEY LRLGI FAKNWKAAEHQALDPTAI HGVTFQFSDLSEEEFEREYTG KGGFPSSNAAGV 67
Short CcCP1	VMMDVSDLPESFDWREKGAFTVKTQGRGSCWAFSTTGAI EGANFATGKLLSLSEQQLVDCDHMCDDLKEKDDCDDGCS 156
Short CPR4	PPLDVKGEPENFDWREKGAFTGKTQKKGSCWAFTTGSI EGANFLATGKLVSLSEQQLVDCDNKCDITKTSCDNGCN 146
Short CcCP1	GGLMTTAFNYLI EAGGLEEEVTPYTGKRGECKFNPEKVAVKVRNFAKI PEDSQI AANVVHNGPLAI GLNAVFMQTYIG 236
Short CPR4	GGLMTTADYLM EAGGLEEEISYPYTGKQGECKFDP NKVAVRVSNFTINI PADENQI AAYLVNHHGPLAI AVNAVFMQTYVG 226
Short CcCP1	GVSCPLICDKKRLNHGVLLVGYGSRGFSILRLGYKPYWI KNSWGKRWGEHGCYRLCRGHNMCGMSTMVSAVVVTQTS 314
Short CPR4	GVSCPLICSKRRLNHGVLLVGYNAEGFSILRLRKKPYWTI KNSWGEQWGEKGYKLCRGHGMCGMNTMVSAAMVTQ 302